EFFECT OF COW URINE DISTILLATE ON CARBENDAZIM INDUCED TOXICITY IN ALBINO RATS WITH REFERENCE TO HAEMATO-BIOCHEMICAL PROFILE

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Received 18-8-2013 Accepted 8-9-2013

ABSTRACT

The present investigation was undertaken to study the haemato- biochemical alterations caused by administration of carbendazim and to evaluate the ameliorative effect of cow urine distillate in albino rats. The study reveals that the toxic effect of dietary fungicide was suppressed by cow urine distillate significantly.

KEY WORDS : Carbendazim, Cow urine distillate, haemato- biochemical, Albino rats.

INTRODUCTION

Carbendazim is a broad-spectrum systemic fungicide with protective and curative action. Carbendazim products are used for the control of a wide range of fungal diseases in a variety of crops. It produces toxicity in the body organs (WHO, 1993) and increase cancer incidences in testis, prostrate and mammary gland. Indigenous cow urine (gomutra) is considered sacred in hindu mythology. It is used for various purposes for its medicinal values. Cow urine can be used for the ailments ranging from liver disease to obesity. The healing properties of cow urine is mentioned in ancient hindu literature and various researchers indicate that cow urine can cure anything from skin diseases to ailments of kidney, liver and heart (Dhama *et al.*, 2005).

MATERIALS AND METHODS

In the present study, a total of 36 healthy two months old male albino rats weighing 140-150 g were procured and used for the experiment .The rats were randomly divided into six groups with six rats in each group. The rats of different groups kept separately and maintained under similar hygienic conditions and fed the standard diet. Commercially available carbendazim (Bavistin) and cow urine distillate (Divyagodhan ark) were used in the experiment.Group I, served as normal control. Group II served as test control and given only cow urine distillate (CUD). Group III and V received Carbendazim @ 400 and 600 mg/kg, b.wt, orally respectively. Group IV and VI received Carbendazim @ 400 and 600 mg/kg, b. wt. along with CUD for 28 days. At the end of the experiment blood was collected from the experimental rats , serum was separated and haematological parameters ;TEC, Hb, PCV and TLC and biochemical parameters; ALT, AST, total Protein, Albumin, Glucose, BUN and Creatinine were studied using standard methods in use. Statistical analysis was done as per method of Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

The results of the haemato-biochemical study are presented in Table 1 and 2. From the table 1 it is revealed that administration of carbendazim induced toxicity in rats at both levels (400 mg and 600 mg/kg body weight). The biochemical parameters ALT, AST, BUN and Creatinine increased significantly by administration of carbendazim at both levels whereas total protein and albumin significantly reduced, at the same time non significant rather negligible increase in all parameters except glucose was observed on administration of cow urine distillate (CUD). Supplementation of

CUD along with carbendazim (at both the levels) partially diminshed the toxic effect as revealed by the change in level of biochemical parameters. Our results are in accordance with the earlier reports (Muthuviveganandavel *et al.*, 2007 and Zari and Al-Attar, 2011). Panicker *et al.* (2013) reported stimulating effect of cow urine urk on haematological parametes in white leghorn chicken.

Table 1: Mean values of biochemical parameters in albino rats fed with carbendazim alone and in combination with cow urine distillate

GROUP	AST(IU/L)	ALT(IU/L)	Total protein (g/dl)	Glucose (mg/dl)	Albumin (g/dl)	BUN(mg/dl)	Creatinine (mg/dl)
I Control	130.22^{b}±4.56	53.43±2.92	5.66±0.95	101.48^{b}±4.03	4.71^{a}±1.89	20.20^{a}±1.78	0.52±0.28
II CUD	116.40^{b} ±4.31	52.88±2.90	5.52±0.94	106.41^{b}±4.12	2.87^{b}±2.65	20.11^{a}±1.79	0.50±0.28
III CBD400	160.01^{c}±4.71	58.34±2.99	4.26±0.76	156.25 ^{a}±4.65	1.71^{c}±0.09	27.07^{b}±0.66	0.57±0.04
IV CUD+ CBD400	142.10^{b}±4.44	49.72±2.62	4.56±0.79	127.54^{c}±4.20	2.16^{b}±0.47	24.54^{ab}±1.18	0.55±0.06
V CBD 600	209.37^{a}±5.39	59.09±2.86	4.06±0.75	162.04 ^{a}±4.74	1.29^{c}±3.62	28.83^{b}±1.62	0.62±0.02
VI CUD+ CBD 600	190.80^{a}±5.14	51.58±2.67	4.45±0.78	158.38 ^{a}±4.69	1.41^{c} ±2.84	27.99^{b}±0.78	0.54±0.09

Mean values bearing same superscripts did not differ significantly (p<0.01).

Reduction in total protein could be due to inhibition of protein synthesis, anorexia, inadequate digestion or absorption by carbendazim administration. Supplementation of cow urine distillate to the rats fed with carbendazim improved the levels of serum proteins which could be due to decreased oxidative stress and decreased toxin absorption. There was a significant elevation in the glucose levels in all groups as compared to control. The reason for the increase in glucose level may be due to the continuous stress in rats because of the long term exposure to carbendazim.

Table 2 : Mean values of haematological parameters in albino rats fed with carbendazim alone and incombination with cow urine distillate

Groups	TEC(millions/µl)	Hb (g/dl)	PCV(%)	TLC(thousands/µl)
I C	10.19^{a}±1.27	14.68^{a}±0.69	44.40^{a}±2.66	6.32^{a}±0.14
II CUD	9.26^{a} ±1.21	13.25^{ab}±0.49	40.20^{a}±2.53	5.53^{a}±0.33
III CBD400	7.85^{b}±0.73	10.65^{b}±0.83	31.95^{b}±2.05	5.92^{a}±0.84
IV CUD+CBD 400	8.48^{b}±0.28	10.67^{b}±0.82	32.0^{b} ±2.10	3.75^{b}±0.15
V CBD 600	8.22^{b}±0.98	10.18^{b}±1.05	30.54^{b} ±2.06	5.14^{ab}±0.08
VI CUD+CBD 600	8.88^{b}±0.69	11.68^{ab}±0.83	35.04^{b}±2.20	6.09^{a}±0.26

Mean values bearing same superscripts did not differ significantly (p<0.01).

A reduction in the glucose levels in the rats which were fed with cow urine distillate along with carbendazim when compared to the control indicated the protective effect of cow urine distillate. A significant increase in the concentration of blood urea nitrogen was observed in groups III and VI as compared with control. Cow urine distillate restored significantly the increased level of BUN in group IV whereas the increased BUN level was not relieved in group VI. The present finding is in close agreement with the observation reported by Selmanoglu *et al*. (2001). A non-significant increase in the concentration of creatinine in group (III-VI) could be due to kidney damage.

Carbendazim administration reduced all haematological parameters significantly at both the dose levels. Results of this study are in agreement with the findings of Muthuviveganandavel *et al.* (2007). Decrease in RBC's may indicate a suppression of erythropoiesis or an increase in destruction of red blood cells (Thibodeau and Patton, 1993). Similar pattern was found in haemoglobin and PCV values (Table 2) whereas non significant changes were observed in erythrocyte indices. Reduction in haemoglobin concentration due to carbendazim toxicity observed in the present study is in agreement with the findings of Hayes (1994) and lowered PCV in carbendazim fed rats could be due to anaemia as a result of depressed erythropoiesis and erythrolysis. No significant reduction was observed in Total leukocyte count (TLC) in Group II, III, V and VI although reduction in W.B.C count was observed in Group IV. The decrease in TLC could be due to the depressed haemopoiesis as a result of bone marrow suppression. Partial improvement in the TEC, Hb and PCV was found in groups fed with carbendazim along with cow urine distillate (Group IV and VI) as compared to toxic groups (III and V).

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